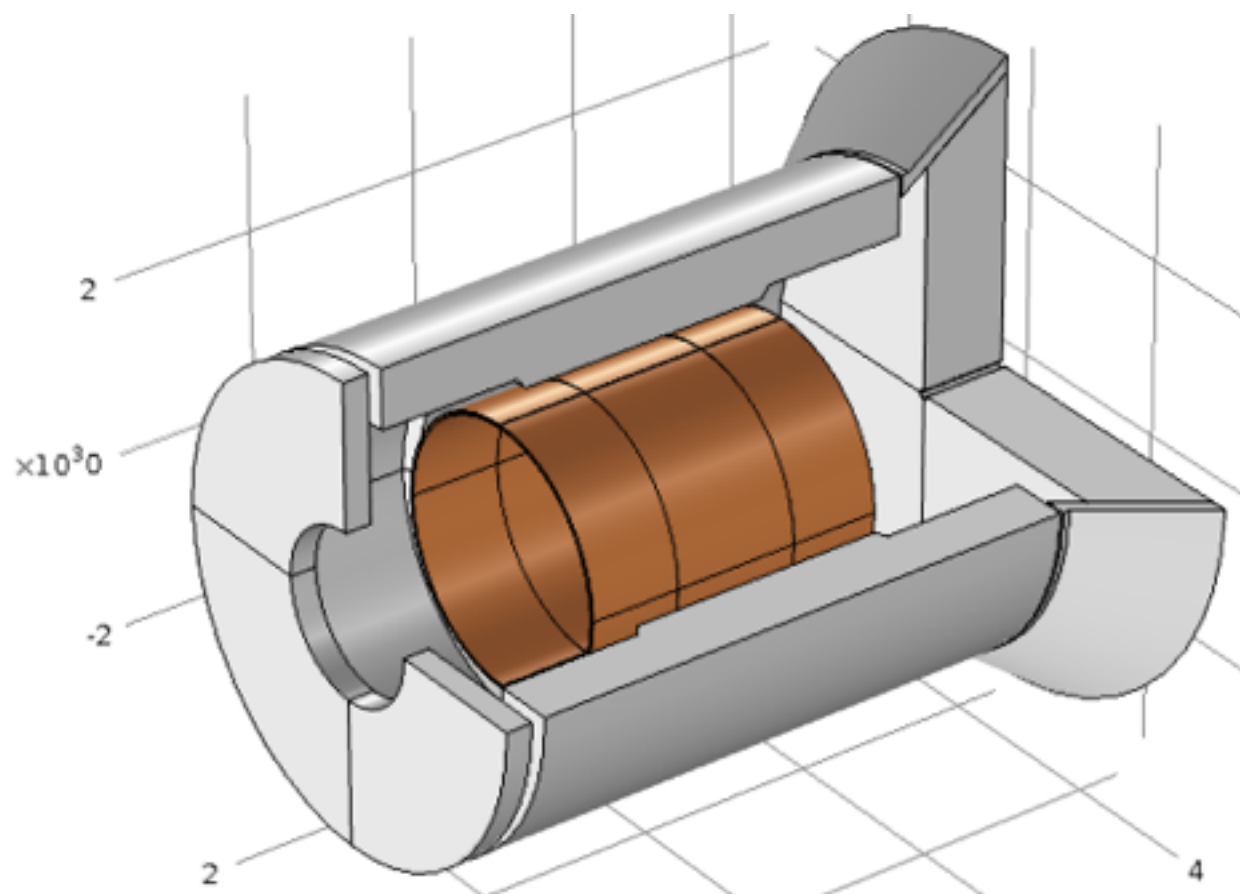




Stony Brook University

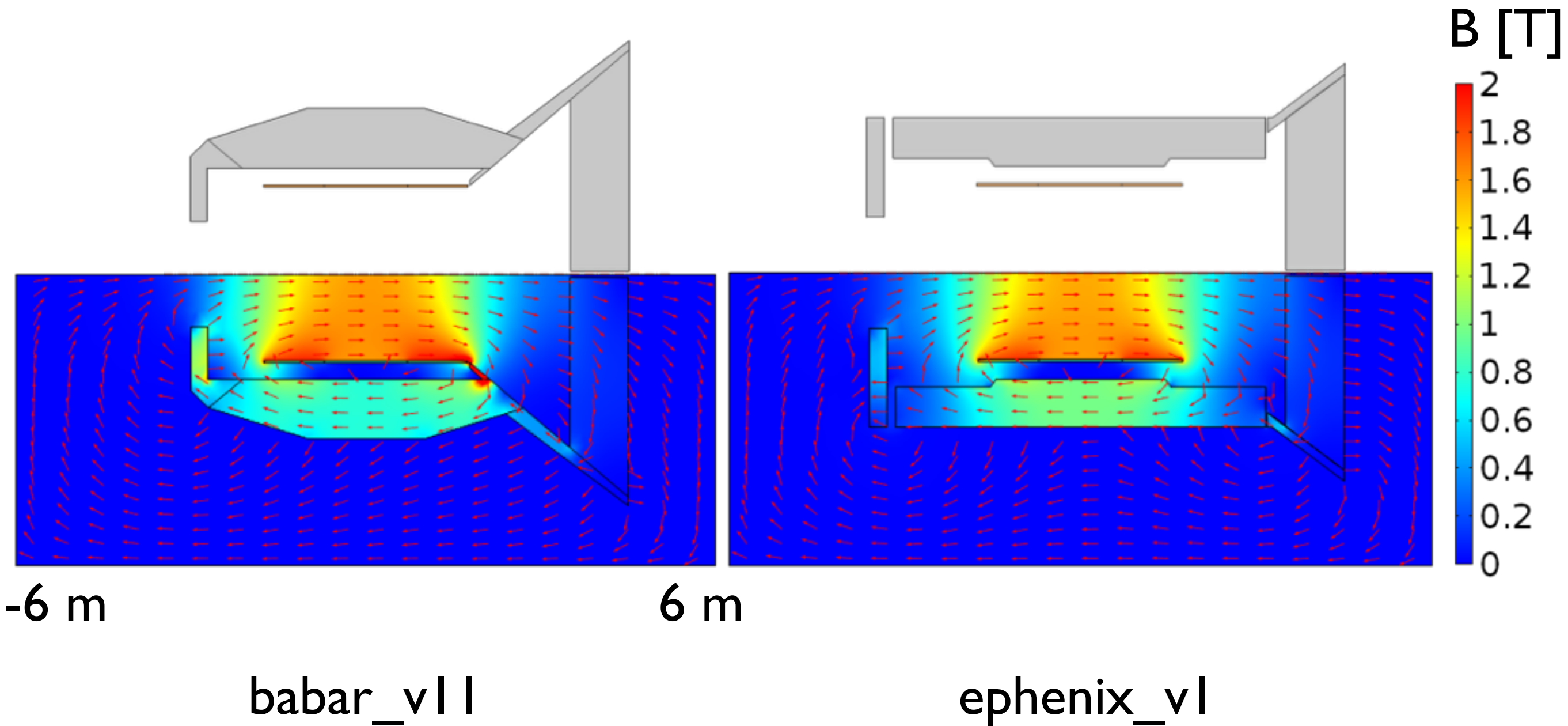


# First COMSOL Evaluation Of New EIC / fsPHENIX Magnet Yoke Design

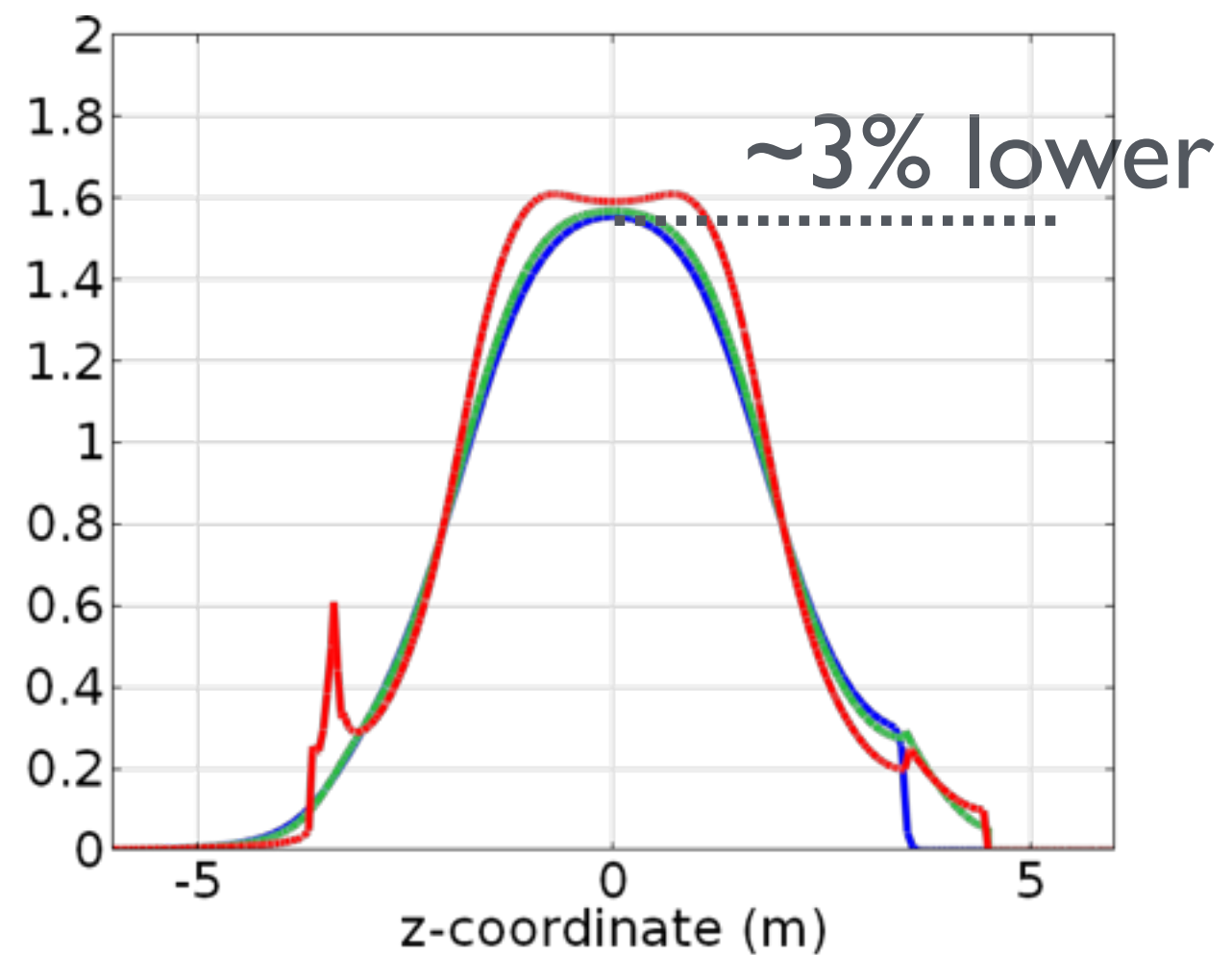
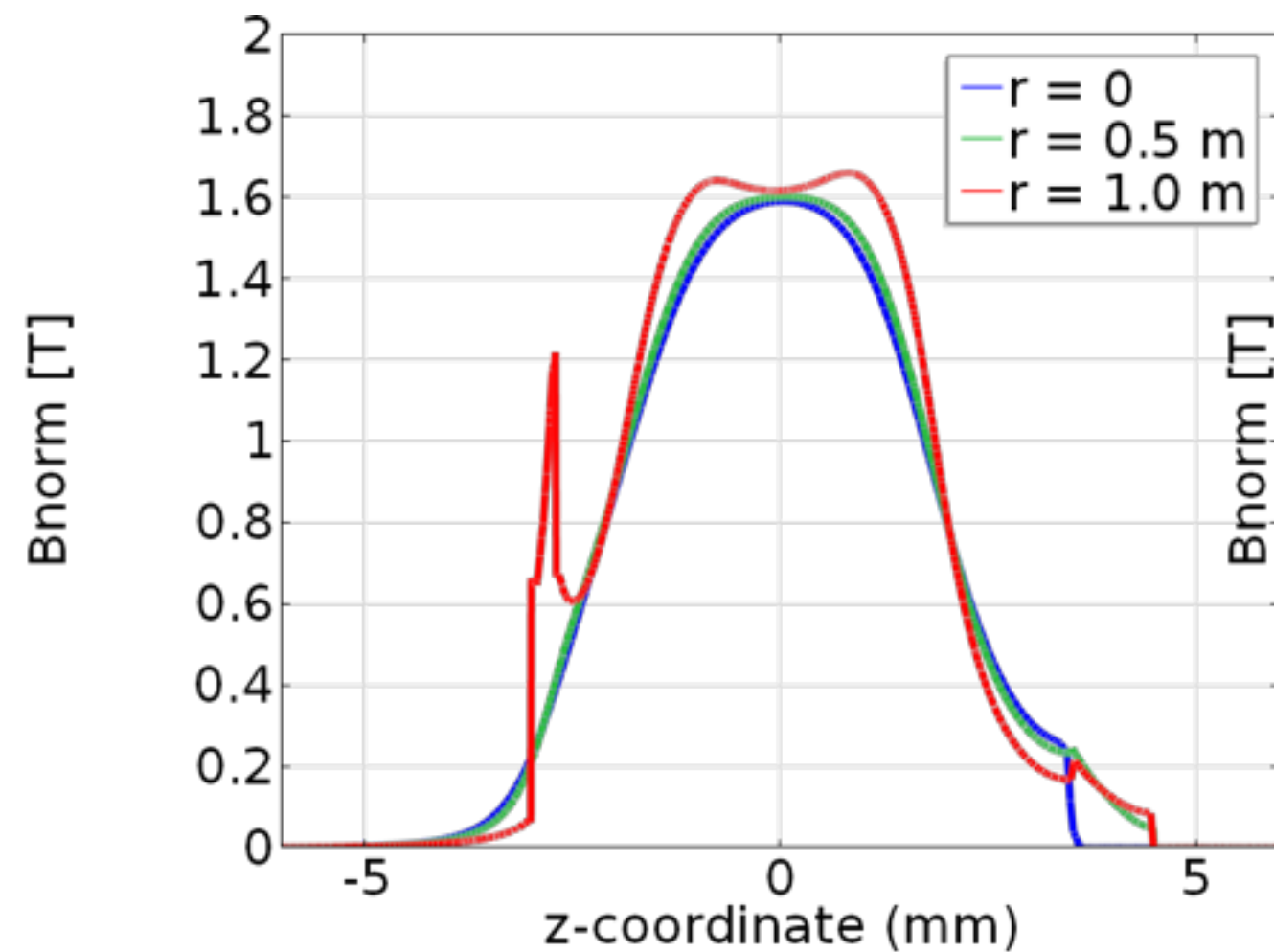
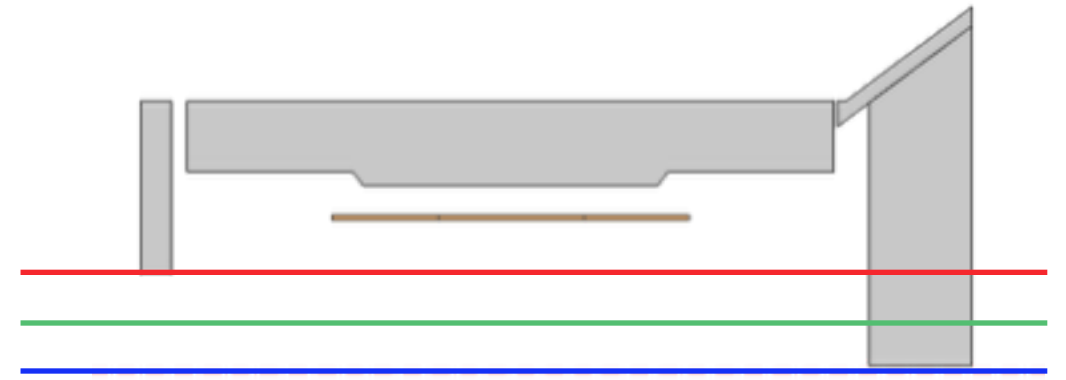
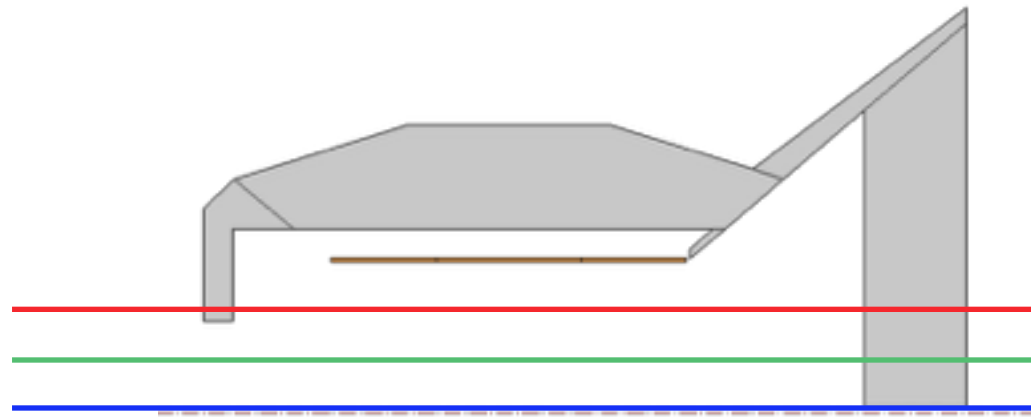
Nils Feege

sPHENIX Engineering Meeting; BNL, February 12, 2015

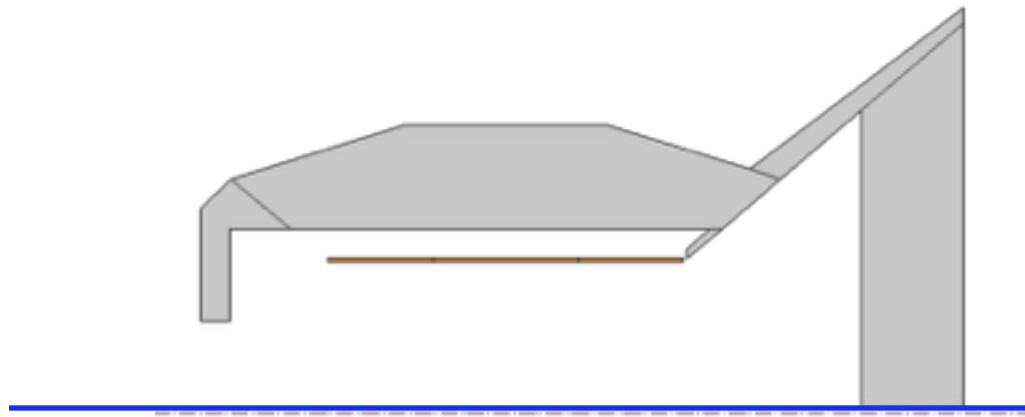
# Magnetic field in COMSOL



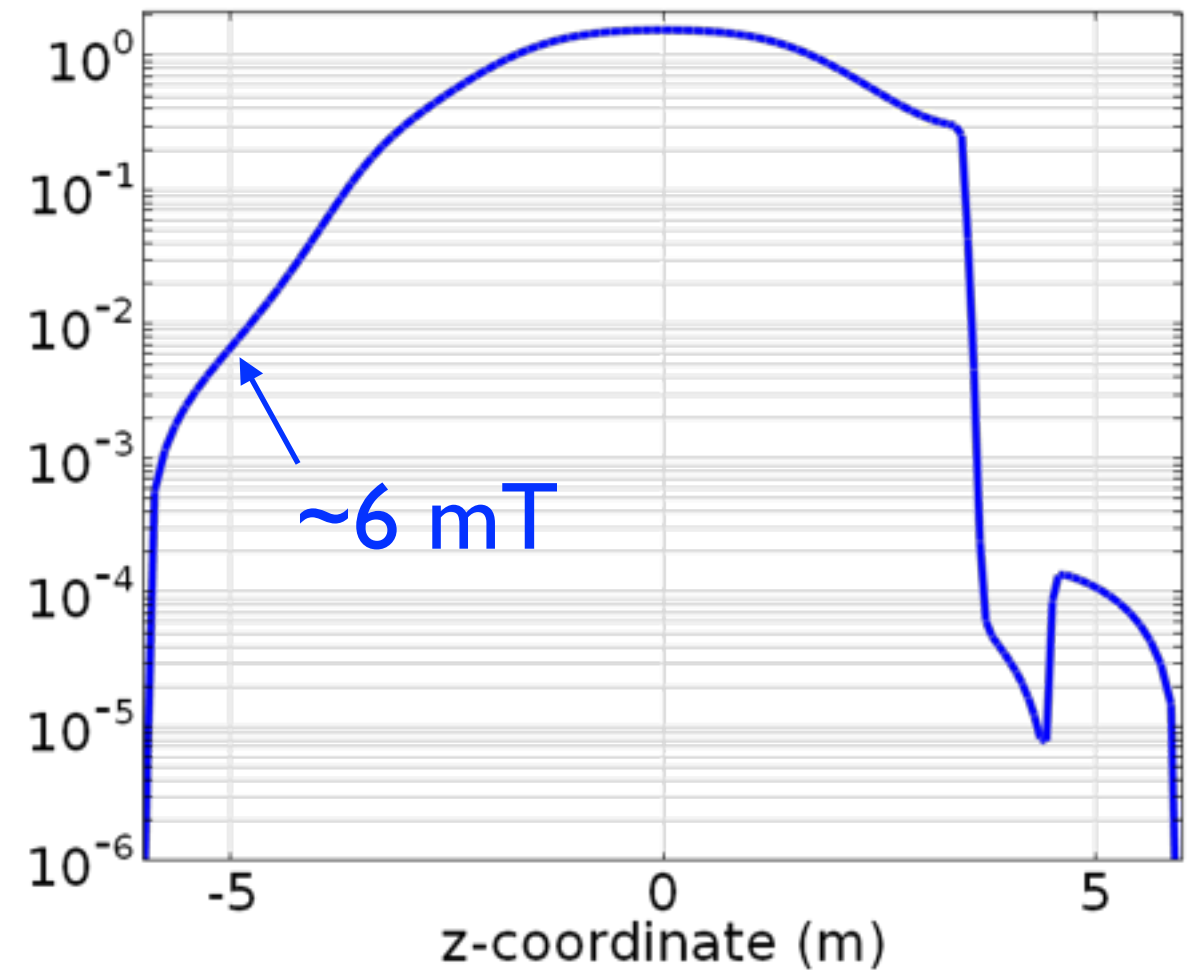
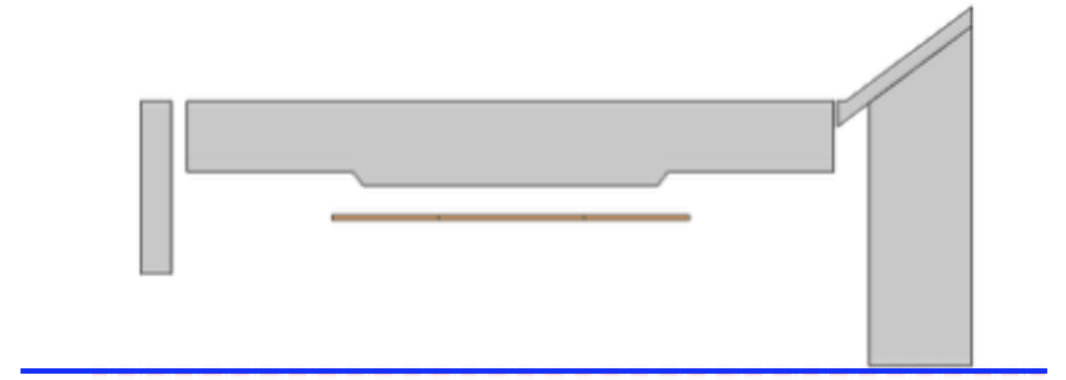
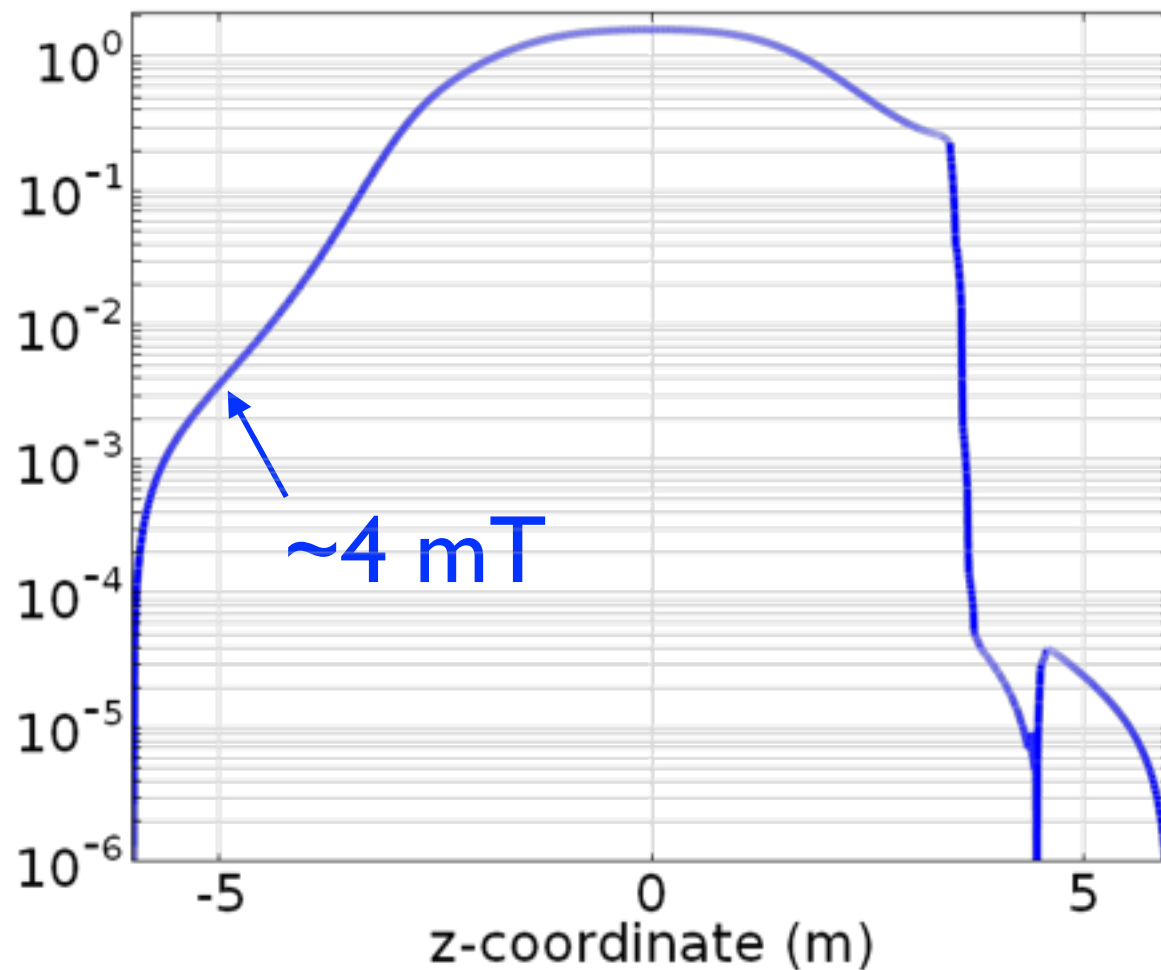
# Magnetic field comparison



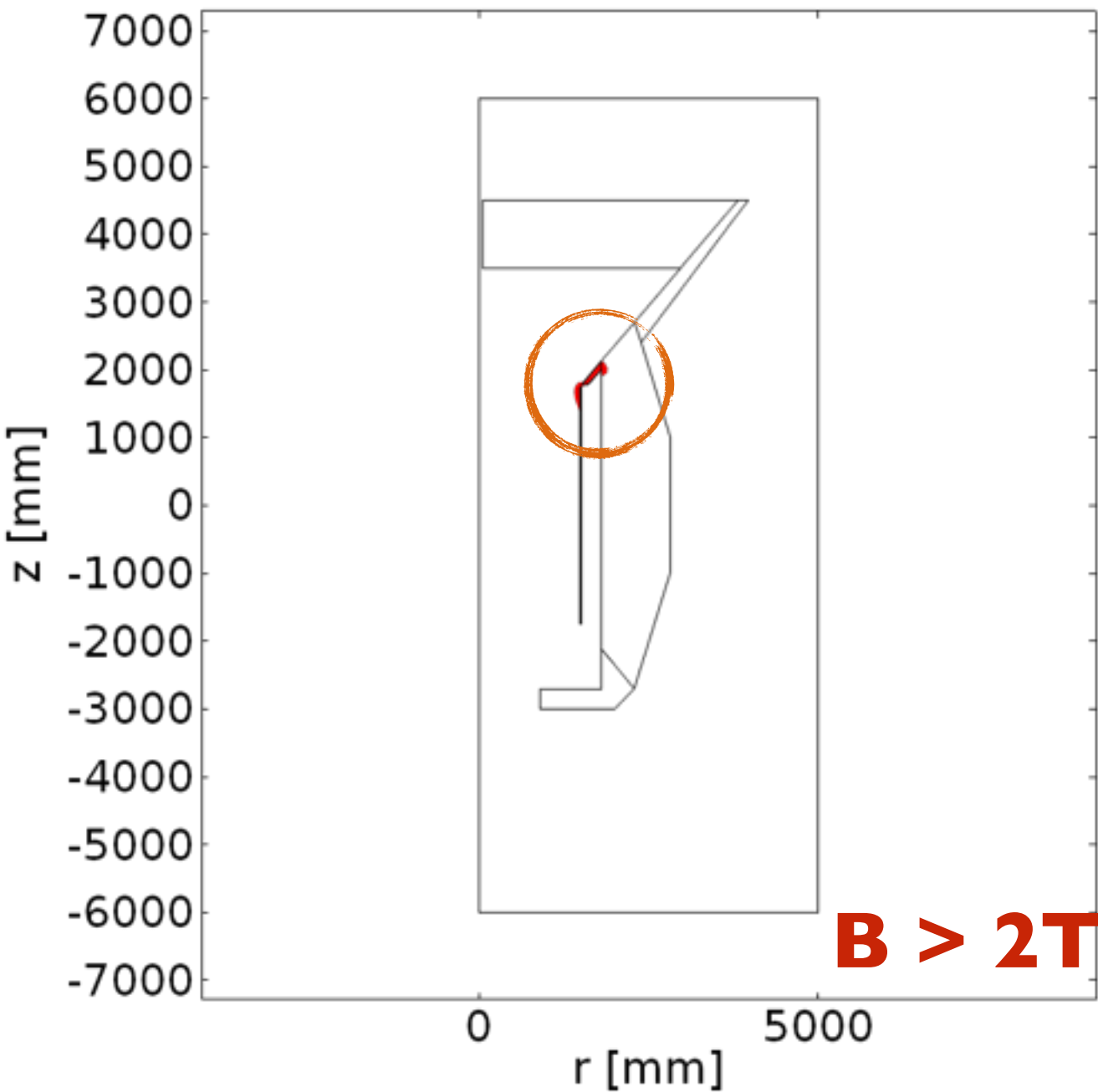
# Magnetic field on beam axis



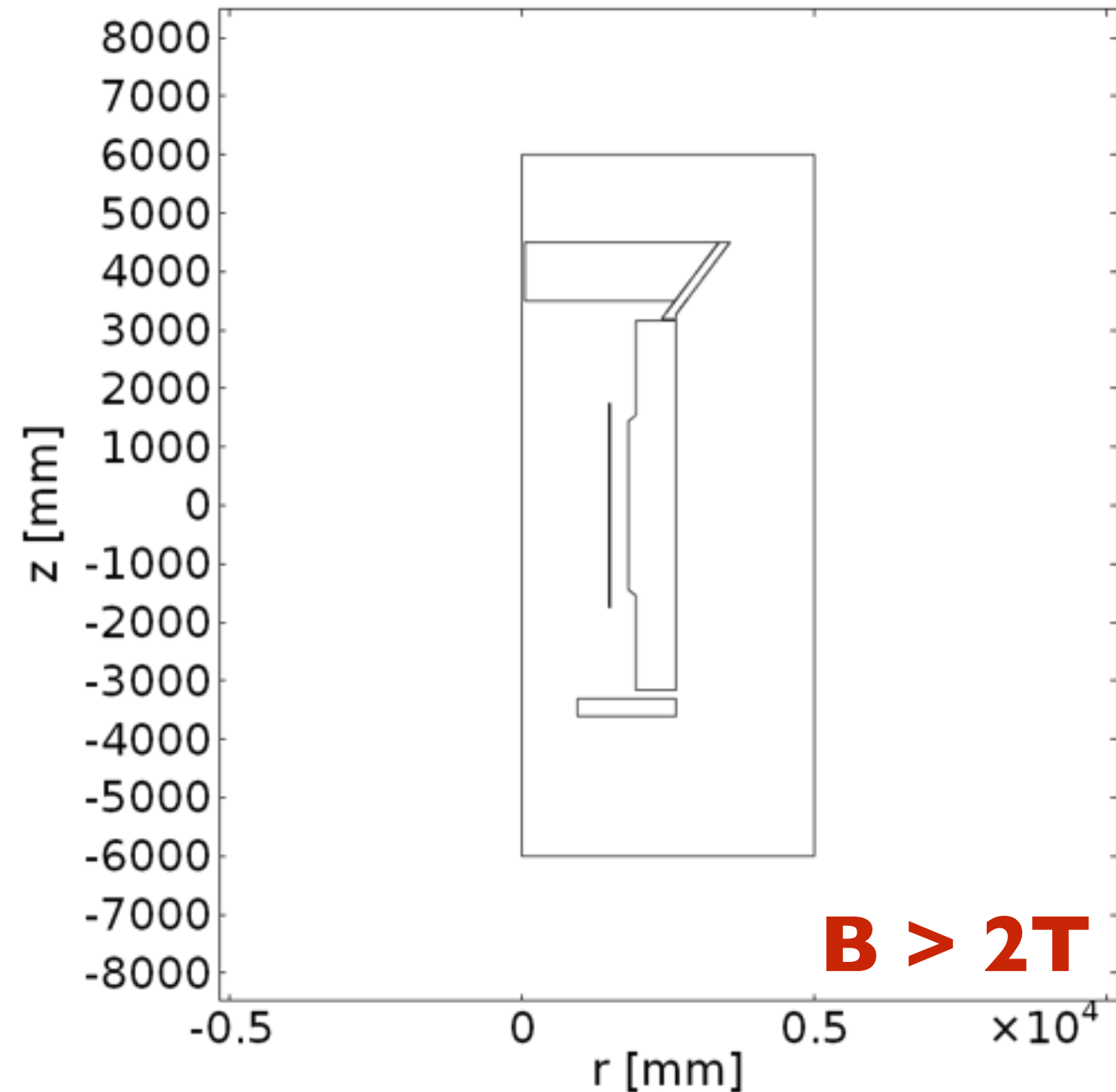
Magnetic flux density norm (T)



# Check for areas of steel saturation

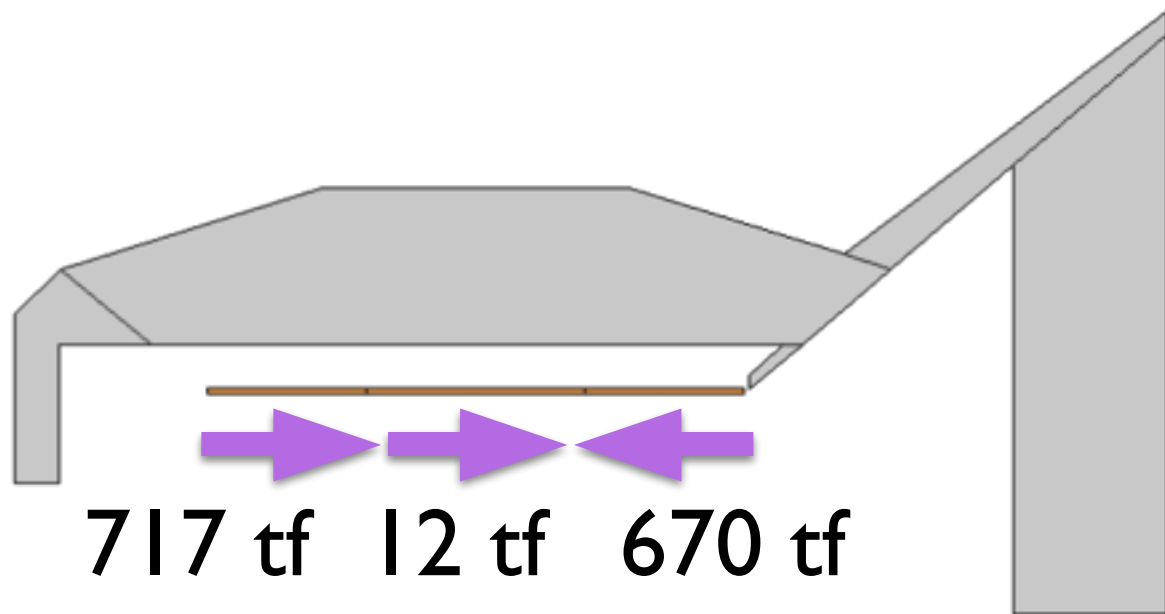


$$B_{\max} = 16.5 T$$

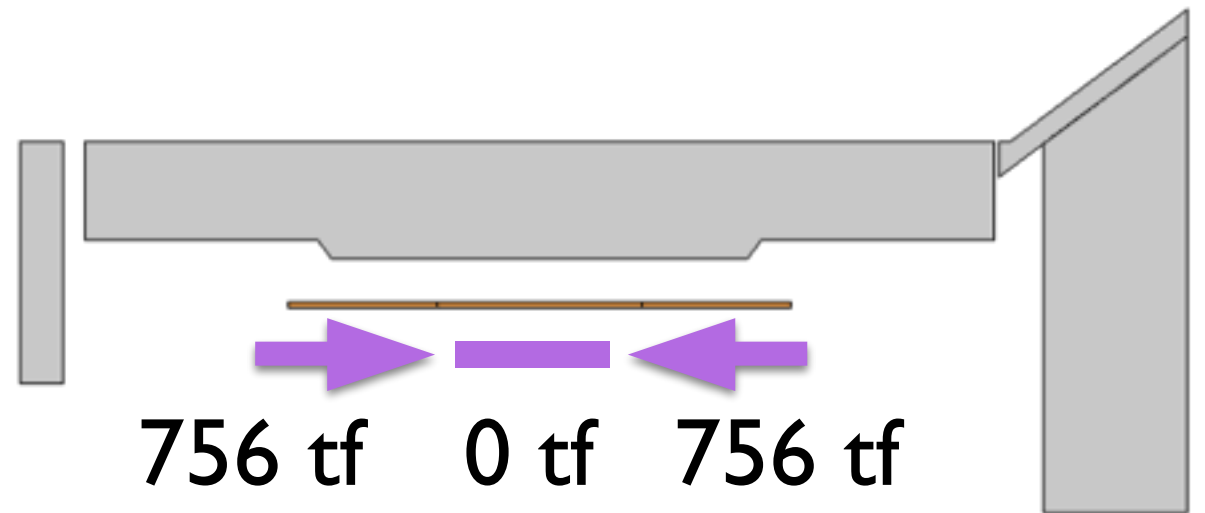


$$B_{\max} = 2.2 T$$

# Magnetic forces on magnet coil



Unbalanced



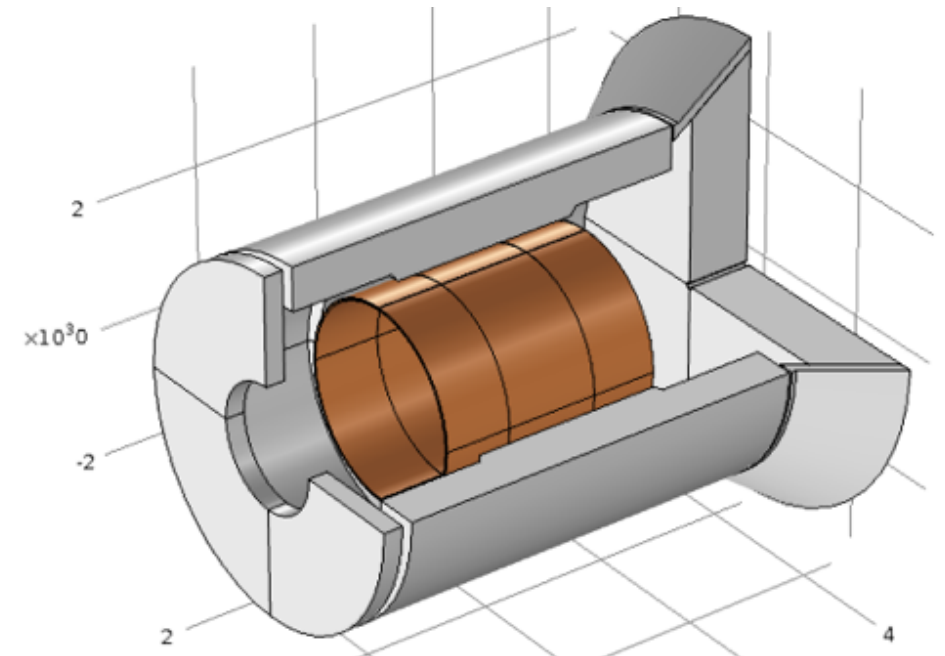
Balanced



# Summary

Promising first look at new yoke design ephenix\_v1:

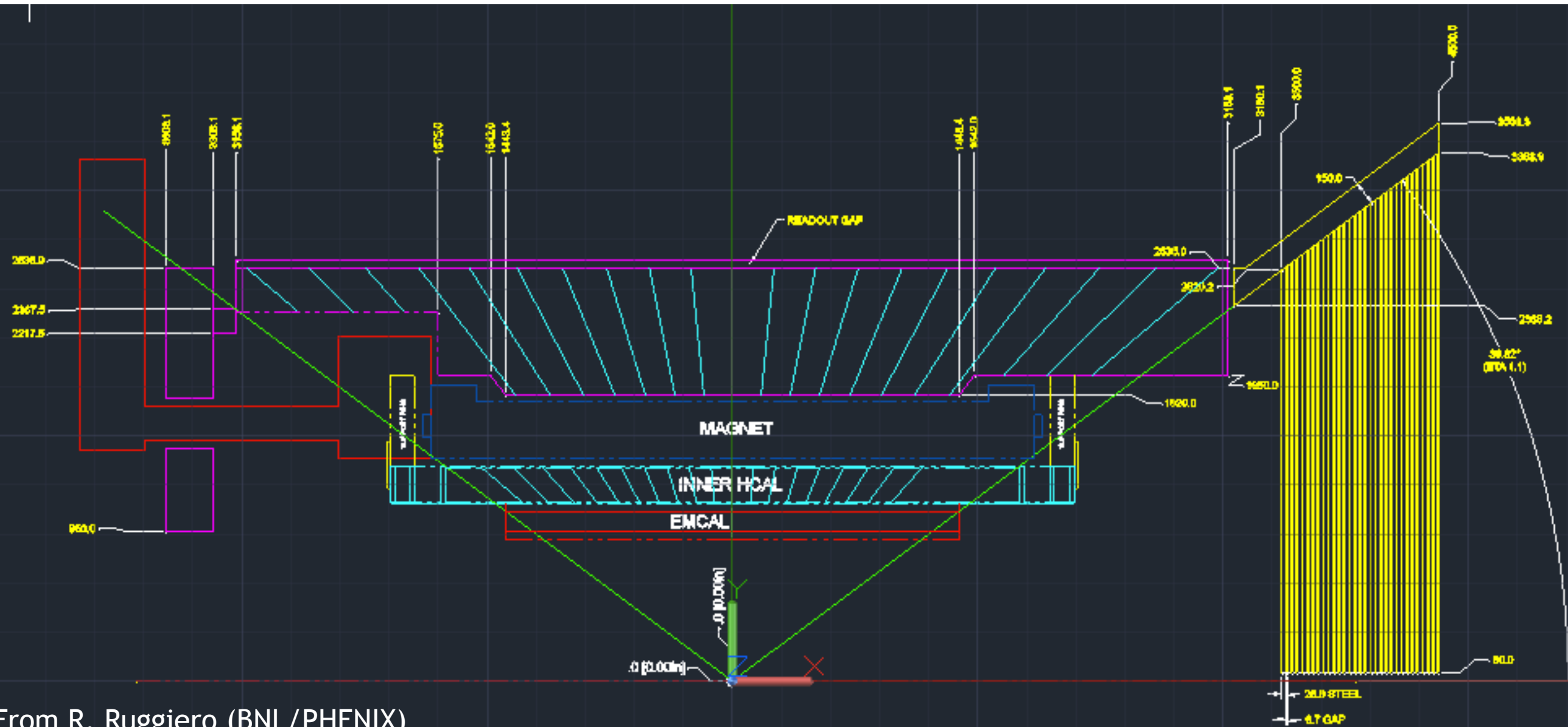
- ❖ Field comparable to previous design
- ❖ No areas  $> 2$  T in steel
- ❖ Forces on coil are balanced



# ***ADDITIONAL SLIDES***

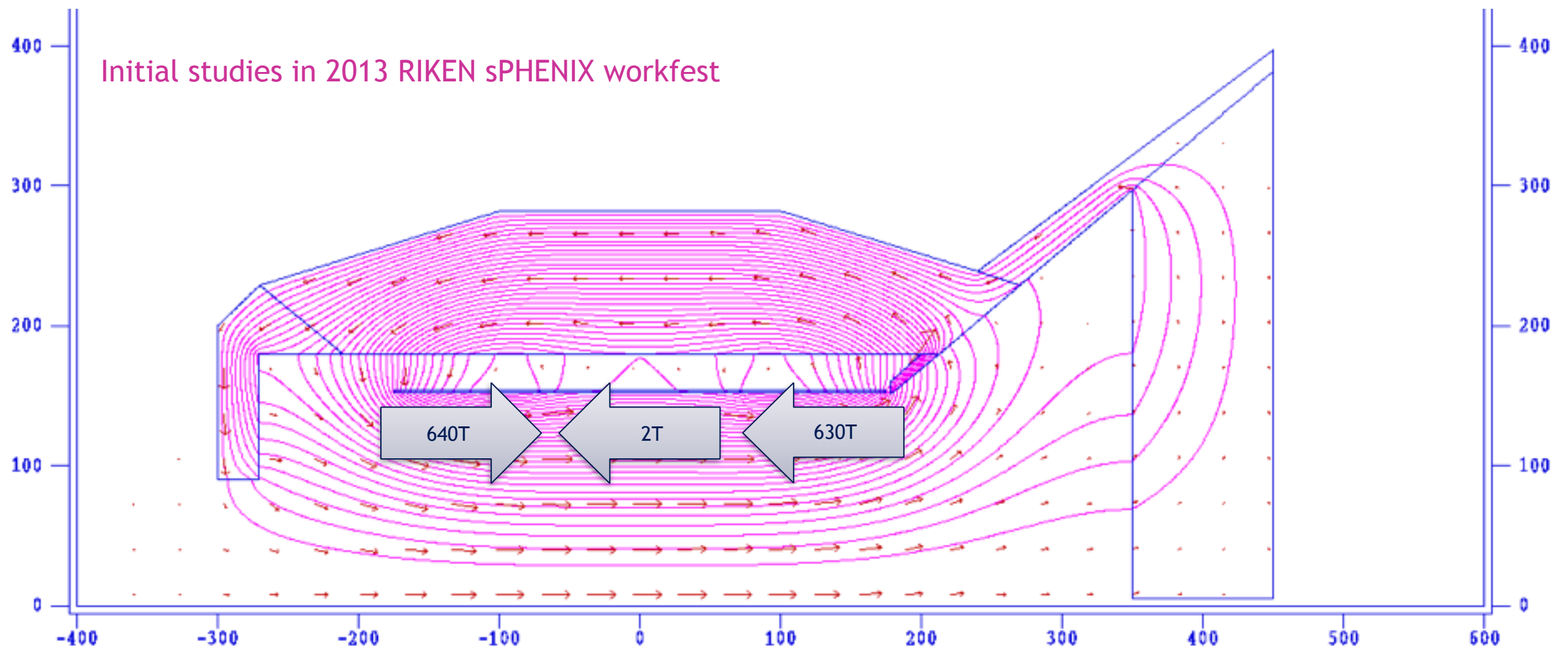


# An updated mechanical design for EIC Detector / fsPHENIX



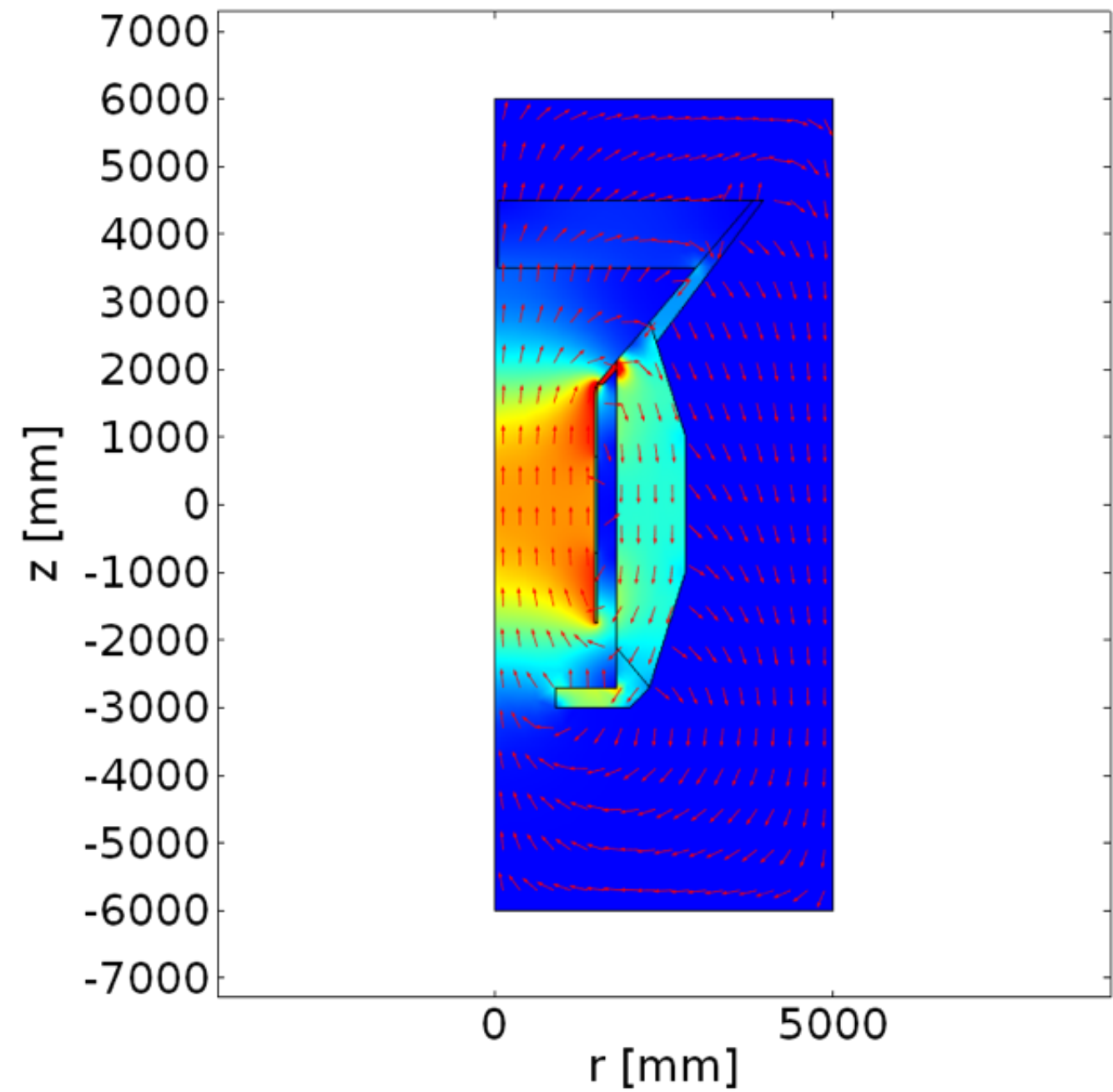
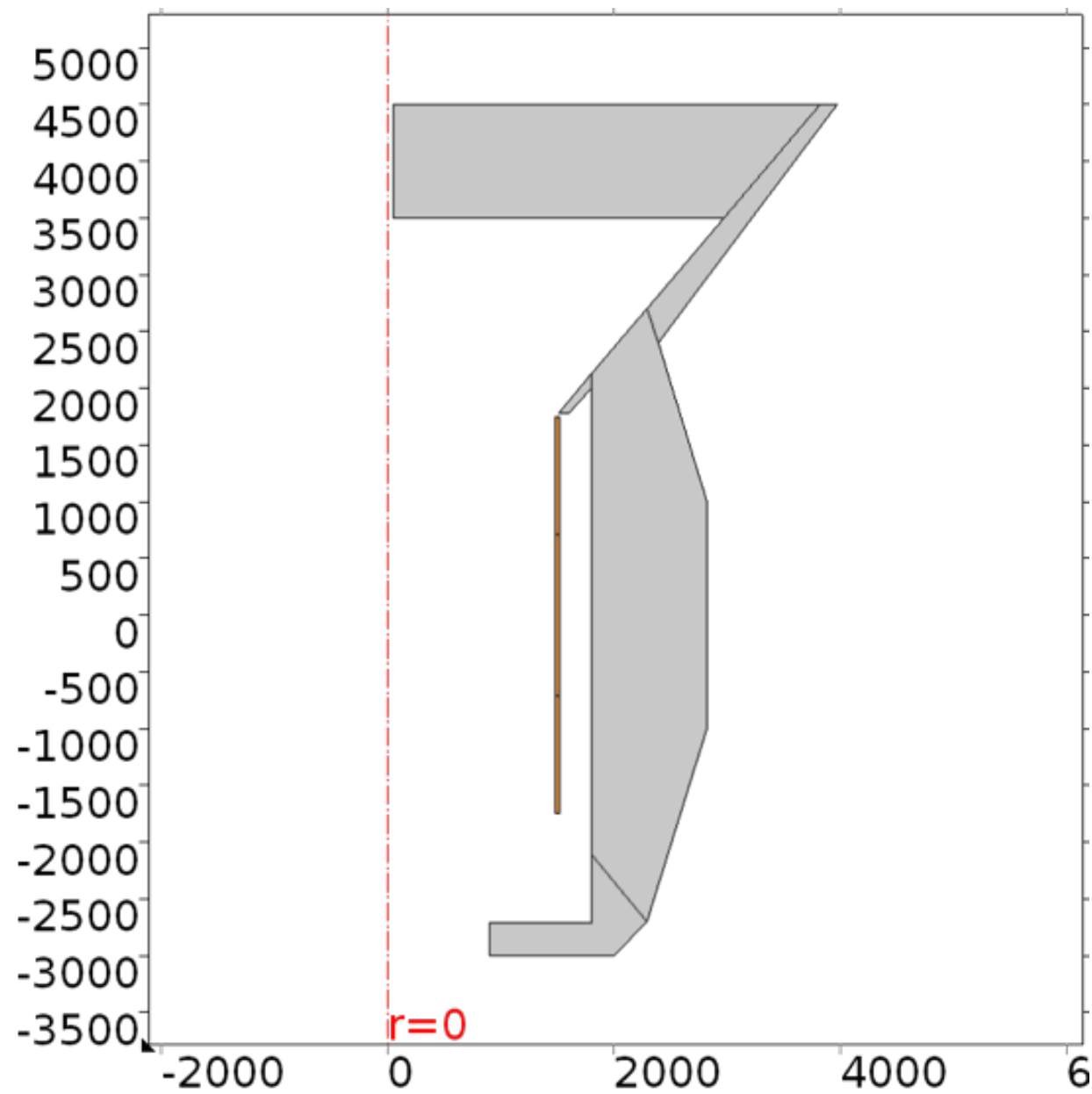
From R. Ruggiero (BNL/PHENIX)

# POISSON force calculation for BABAR\_VII



J. Huang

# BABAR\_VII



# EPHENIX\_VII

